

Severe local storms, May, 1930—Continued

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Fremont Experiment Station, Colo.	15					Hail	Storm very severe; character of damage not reported.	Official, U. S. Weather Bureau.
Pittsburg, Tex.	15					Tornado and rain	Considerable damage to crops and property.	Do.
New Orleans, La.	16	3:15 p. m.	1.5 mi.		\$50,000	Thundersquall	Several buildings damaged; telephone wires blown down; path 1.5 miles long.	Do.
Avondale, Colo., and vicinity.	16	3:30-4 p. m.	2-3 mi.			Hail	Considerable damage to crops and roofs of buildings.	Do.
Lufkin, Tex.	16	5 p. m.	7 mi.			do	Tomato and other crops damaged; windows and roofs pierced.	Do.
Woodward County, Okla.	17	6 a. m.	6 mi.			do	Crops severely damaged over path 15 miles long.	Do.
Slayden, Tex.	17	10:30 a. m.	16		500	Tornado	Slight damage.	Do.
Rocky Ford, Colo.	17	12:30 p. m.	3 mi.		40,000	Hail	Severe damage to crops and small fruits; some poultry killed.	Do.
Lamar, Colo., and vicinity.	17	1 p. m.	10-15 mi.		50,000	do	Crops damaged and livestock killed.	Do.
Mont Belvieu, Tex.	17	3 p. m.	100		6,000	Tornado and rain	Derricks damaged; 6 persons injured.	Do.
Bristol, Colo. (near)	17	5 p. m.	6 mi.		25,000	Hail	Crops damaged.	Do.
Dublin, Tex. (near)	17	6 p. m.	6 mi.			Hail and wind	Severe losses to crops; poultry killed; roofs damaged.	Do.
Cleburne, Tex.	17	7 p. m.	6 mi.		500,000	do	Extensive property damage.	Do.
Ballinger, Tex.	17	8:30 p. m.				Hail	Livestock and poultry killed; all crops considerably damaged.	Do.
Ellis to Dallas Counties, Tex.	17	do	3 mi.	3		Rain, hail, and wind.	Widespread damage to crops and other property.	Do.
Madison, Tex.	17	9 p. m.	50		3,500	Tornado	Chief damage to property other than crops.	Do.
Breckenridge, Tex.	17					do	Several oil derricks demolished.	Do.
Broken Arrow, Okla. (near)	17					do	Minor property damage.	Do.
Marion, Ark.	18	10:30 a. m.	440	4	7,600	do	Some property destroyed or damaged; 8 persons injured.	Do.
Somerville, Tenn. (near)	18	Noon	200		25,000	do	Business property damaged; many shade trees broken; 4 persons injured.	Do.
Tichnor to Wabash, Ark.	18	3:30 p. m.		14	14,500	do	34 persons injured; considerable property damage.	Do.
Chattanooga, Tenn.	18	P. m.				Thunderstorm and wind.	Falling trees and limbs broke telephone and electric wires; cars delayed; streets flooded and badly washed.	Do.
Knoxville, Tenn.	18					do	Trees and poles blown down paralyzing traffic; minor damage to buildings.	Do.
Taylor County, Tex.	18					Hail	Crops severely damaged.	Do.
Startup, Wash.	20	2:30 p. m.	1,700			Hail and wind	Fruits considerably damaged.	Do.
Black Hawk County, Iowa.	20	5-6 p. m.			55,200	Hail, wind and flood.	Heavy damage by hail; considerable damage by flood.	Do.
Wewahitchka, Fla. (15 miles north of).	22	12:30 p. m.				Hail	Considerable damage to crops.	Do.
Tallahassee, Fla. (6 miles east of).	22	4:30-5 p. m.	880			do	Corn, cotton, and cane damaged; poultry killed.	Do.
Clare to West Branch, Mich.	23	1:30-3 p. m.	880-1,760		200,000	Tornado followed by hail.	Property of all kinds severely damaged or destroyed.	Do.
Madison, Fla. (6 miles south of).	23	5 p. m.			1,000	Hail	Tobacco, cotton, and corn damaged.	Do.
Baltimore, Md.	24			4		Thunderstorm and squall.	Storage plant unroofed; some damage by flooding.	Do.
Streator, Ill., and vicinity.	27	5:30-5:40 p. m.	880-3,520		140,000	Tornado	Heavy property damage; livestock killed; 8 persons injured; path 15 miles long.	Do.
Fort Assiniboine, Mont. (near).	28					Wind	Many acres of crops ruined, necessitating re-seeding.	Do.
Kalspell, Mont.	29	5:12 p. m.			1,500	Hail	Vegetable and flower gardens injured; glass in greenhouses and residences broken.	Do.
Arriba, Colo.	31	4-5 p. m.			5,000	Wind	Grain badly whipped.	Do.
Wagon Mound, Mora County, N. Mex.	31	5 p. m.	300	2	150,000	Tornado	40 dwellings and 8 business houses more or less wrecked; 20 persons injured.	Do.

RIVERS AND FLOODS

By R. E. SPENCER

The most severe floods of May were those in the Shreveport, La., river district along the Red and Sulphur and Cypress Rivers. Others of some importance, resulting from the same general rains, occurred to the south-westward in the rivers of east and central Texas, to the northward in the Arkansas and White Rivers, and to the eastward in the Ouachita and Pearl Rivers.

The rains which caused these rises, while most concentrated in northeastern Texas, were fairly continuous and occasionally excessive between May 3 and 17-18 from central Texas and Oklahoma eastward to Mississippi. The heaviest falls occurred at three and four day intervals beginning with the third.

In the Shreveport district, comprising the Red River and its tributaries above Shreveport, La., the streams rose steadily following the third, beginning with comparatively low to moderate stages and reaching flood stages and crests as indicated in the table at the end of this report. The crests at Finley, Tex., on the Sulphur River, and at Jefferson, Tex., on the Cypress River, were

the highest of record. Warnings were first issued for the Sulphur River, on the 3d, and with continued rains were subsequently amplified as necessary to cover the entire district. These forecasts were timely and adequate, and their dissemination was accomplished in a very effective manner, with the result that only five lives were lost, and about \$990,000 worth of livestock and other movable property were saved.

Concerning losses and the extent of overflow, the official in charge of the Weather Bureau office at Shreveport reports as follows:

The total loss in the Shreveport river district has been estimated at \$2,370,000. This figure covers the sections in Texas overflowed by the Sulphur and Cypress Rivers and the area overflowed by the Red River and its tributary bayous and creeks from the vicinity of New Boston, Tex., and Idabel, Okla., to the vicinity of Ninock, La., the river distances along the Red being about 300 miles. In Arkansas and Louisiana most of the damage resulted from the overflow of bayous and creeks back of the levees, and in Caddo Parish, La., the overflow was augmented to a great extent by the record-breaking flood waters from the Cypress River, which has an outlet into Caddo Lake and thence by connecting bayous and drainage canals to Cross Bayou that empties into Red River within the northern city limits of Shreveport. Cross Bayou is also an outlet for Cross Lake. Cross Lake is dammed to form a reservoir of many square miles for the main water supply of Shreveport.

Specifically, the flood losses along the respective rivers were as follows:

	Sulphur River	Cypress River	Red River at and above Shreveport, La.	Total
Tangible property (bridges, buildings, highways, etc.)	\$115,500	\$100,000	\$525,500	\$741,000
Matured crops	36,000	24,000	60,000	120,000
Prospective crops	162,000	25,000	1,225,000	1,412,000
Livestock and other movable farm property	6,500	1,000	3,500	11,000
Suspension of business	26,000	5,000	115,000	146,000
Total	346,000	131,000	1,893,000	2,370,000
Value of property saved by warnings	87,000	15,000	888,000	990,000

Estimates of the acreage covered by flood waters to a considerable depth were: Along Sulphur River, about 23,500 acres; along Cypress River, 15,000 acres; along Red River, 151,500 acres; total, 190,000 acres.

Losses, especially heavy in prospective crops, included also damage to a considerable number of oil wells and the loss of hay and spring vegetables, as potatoes, tomatoes, etc. Loss of movable property included very little live stock.

Damage to levees, fronting Red River, in the vicinity of Shreveport amounted to about \$100,000 in addition to the above.

In the Houston, Tex., district, which comprises the Sabine, Neches, and Brazos Rivers, and the Trinity River from Long Lake, Tex., to the mouth, the floods were comparatively less severe and the destruction proportionally less. A brief statement of the overflow in the neighborhood of Weather Bureau gaging stations is given by the official in charge of the Weather Bureau Office at Houston:

The Trinity overflowed its banks at Long Lake for one-half to 1 mile on the right and 1 to 2 miles on the left bank; at Riverside, one-fourth mile on the right and 1½ miles on the left bank; at Liberty about 5 miles on the right bank. The Sabine at Logansport, La., overflowed both banks about 2½ miles.

Stage forecasts were accurate and a saving of \$198,200 was effected through their use. A tentative estimate of losses places the total at \$895,350, distributed as follows:

	Brazos and tributaries	Trinity	Sabine
Tangible property	\$71,000	\$50,500	2,000 acres.
Matured crops	11,600	50,000	1,000 acres.
Prospective crops (mostly cotton)	244,000	105,500	1,000 acres.
Livestock and other movable property	10,500	12,500	\$1,000.
Suspension of business	31,500	61,500	\$5,750.
Additional, in Anderson County		250,000	
Savings by flood warnings	40,500	132,500	\$25,200.

1 8 acres. 2 3,000 acres. 3 14,050 acres. 4 8,000 acres.

Along the Trinity River (including Elm Fork) above Long Lake, Tex., three persons were drowned and losses totaled at least \$95,290, distributed as follows:

To highways	\$3,200
Resulting from levee breaks below Dallas, Tex.	2,000
Levee damage in the Dallas Levee District	2,000
Prospective crops (6,000 acres)	9,000
Movable property	7,000
Suspension of business	72,090

The value of property saved through the use of Weather Bureau flood warnings was about \$122,000.

The only important damage done by the Arkansas and White rises was that to prospective crops, several thousand acres of planted low lands having been inundated. As the season is not too far advanced, however, this area can be replanted.

Of the floods in the Ouachita and lower Red Rivers Mr. R. A. Dyke, of the Weather Bureau Office at New Orleans, La., reports in part as follows:

Rainfall was especially heavy in the Ouachita Basin on May 16-19, with 8.55 inches at Arkadelphia and 12.45 inches at Camden; 7.50 inches occurred at Prescott, Ark., on the Little Missouri; and an average of 7 to 8 inches fell over the basin below Camden. The excessive rainfall over the Smackover and Eldorado oil sections caused a large overflow of Smackover Creek on the 18th-19th, with much damage to oil stores, wells, and equipment in those sections before the main crest of the flood in the Ouachita channel arrived there.

Reports of losses resulting from this flood are incomplete. In Nevada County, Ark., drained largely by the Little Missouri River, crop losses were estimated at 20 per cent, and damage to bridges amounted to about \$10,000. From Camden, Ark., it is reported that in Ouachita, Dallas, Union, Calhoun, Bradley, and Columbia Counties roads were damaged to the extent of \$70,000, and prospective crop losses of \$20,000 occurred; loss due to suspension of business was \$2,000; money value of property saved by warnings was about \$10,000. From Felsenthal, in extreme southeastern Union County, a loss of \$250 to prospective crops and of \$200 worth of livestock is reported. There were some losses from flooding of oil wells near the Arkansas-Louisiana line. It has been impracticable to obtain estimates of the losses in the oil fields, which newspaper reports give indefinitely as "several million dollars." In addition, many people were rendered homeless in the Smackover area.

The warnings enabled stockmen to remove cattle from the bottoms to places of safety.

The flood in the Red River below Shreveport, La., was due chiefly to the rainfall of May 16-19, occurring at a time when the river was rising because of previous rains. Heavy rains of 8 inches or more, over the area draining into Red River through Lake Bisteneau, contributed materially to the rise, causing a higher stage at Alexandria than would have been expected from the crest stage at Shreveport, and the carrying capacity of the channel below Shreveport as indicated by stages in the first part of the rise. Rainfall from other parts of the basin draining into the Red River below Shreveport and above Alexandria was not remarkably heavy; the amounts ranged from 1.65 inches at Grand Cane, La., to 5.75 inches at Arcadia, La.

A report of losses along this reach of the Red River will appear in a later issue of the REVIEW.

Damage done by the floods in the Pearl system was comparatively slight:

Bridges, highways, lumber, etc.	\$7,700
Prospective crops (3,000 acres)	18,500
Livestock and other movable property	100
Suspension of business	22,500
Total	48,800

In addition to a saving of about \$5,000 in movable property, the flood warnings were especially valuable in preventing livestock losses.

As a result of the Tombigbee-Black Warrior flood a considerable area of the lowest bottom lands of the Black Warrior from above Tuscaloosa to the mouth of the river, a distance of about 150 miles, was flooded, and lowlands of the Tombigbee at places above Demopolis and more extensively below that point, for a distance of about 180 miles, and extending inland as much as 2 miles, were also inundated.

Reports of damage, undoubtedly incomplete, give the following figures:

Tangible property (mostly highways)	\$14,400
Matured crops	2,000
Prospective crops (40,000 acres)	220,000
Livestock and other movable property	7,900
Suspension of business	29,500

Total	273,800
Value of property saved through Weather Bureau flood warnings	112,000

The Verdigris River flood, arising from heavy local rains in northeastern Oklahoma and southeastern Kansas,

on April 29 and 30, overflowed approximately 6,000 acres and damaged crops to the extent of about \$100,000 and tangible property to about \$25,000. The greater part of the damage occurred in Montgomery County, Kans. Eight thousand dollars was saved through the Weather Bureau flood warnings.

Damage amounting to about \$10,500 resulted from the Kansas and Big Blue River floods—\$6,000 in railroad and bridge damage near Belvue, Kans., and \$4,500 in the vicinity of Beatrice, Nebr. The value of warnings issued for these rises was about \$3,500.

The remaining May floods were, in the main, unimportant. That in the Illinois River, continuing from April, caused no loss and little inconvenience. On the lower Rio Grande slight damage was done to a road under construction near Brownsville, Tex. The Pacific drainage rises were without material consequence.

A belated report of damages resulting from the Tallahatchie River flood of January-April places the loss in crops at \$3,000. The flood beginning on May 18 in this stream will be discussed later.

[All dates in May unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
EAST GULF DRAINAGE					
Tombigbee: Lock No. 4, Demopolis, Ala.	Feet 39	20	(1)	54.3	28
Black Warrior: Lock No. 10, Tuscaloosa, Ala.	46	19	22	56.5	20
Pearl:					
Edinburg, Miss.	21	19	25	24.9	22
Jackson, Miss.	20	20	(1)	31.9	28
Monticello, Miss.	18	20	23	20.8	20
Columbia, Miss.	18	20	25	21.2	23
West Pearl: Pearl River, La.	13	23	(1)	15.4	24
MISSISSIPPI DRAINAGE					
Illinois:					
Peru, Ill.	14	(2)	14	18.8	Apr. 23
Henry, Ill.	10	(2)	9	13.3	Apr. 25
Peoria, Ill.	18	(2)	4	19.9	Apr. 26
Havana, Ill.	14	(2)	14	16.2	Apr. 28-29
Beardstown, Ill.	14	(2)	14	16.8	Apr. 30
Pearl, Ill.	12	(2)	8	12.7	1-4
Kansas:					
Wamego, Kans.	16	8	8	16.0	8
Topeka, Kans.	21	8	8	22.0	8
Lawrence, Kans.	18	8	8	18.5	8
Smoky Hill: Lindsborg, Kans.	19	7	8	21.5	7
Big Blue:					
Beatrice, Nebr.	16	14	15	17.7	14
Randolph, Kans.	21	8	8	22.7	8
Arkansas:					
Dardanelle, Ark.	20	11	17	24.3	11
Morrilton, Ark.	20	11	12	22.0	12
Yancopin, Ark.	29	13	27	31.5	23
Verdigris:					
Independence, Kans.	30	(2)	1	38.4	1
		8	8	30.4	8
Sageeyah, Okla.	35	2	3	35.3	2
North Canadian: Woodward, Okla.	4	16	16	4.0	16
Petit Jean: Danville, Ark.	20	10	14	25.3	12
White:					
Calico Rock, Ark.	18	11	11	21.3	11
Batesville, Ark.	23	11	12	28.7	12
Georgetown, Ark.	22	14	22	23.2	19
De Valls Bluff, Ark.	24	19	23	24.4	20
Black: Black Rock, Ark.	14	11	12	16.1	12
Catche: Patterson, Ark.	9	20	20	9.0	20
Tallahatchie: Swan Lake, Miss.	25	18	(1)	30.3	29-30
Red:					
Index, Ark.	27	20	21	27.2	21
Fulton, Ark.	26	17	27	32.5	22
Springbank, Ark.	37	23	26	37.7	24
Alexandria, La.	36	25	(1)	41.2	June 5-6
Sulphur:					
Ringo Crossing, Tex.	20	4	24	27.2	17
Finley, Tex.	24	12	28	31.7	19
Cypress: Jefferson, Tex.	18	17	27	28.6	20
Lake Bisteneau: Ninock, La.	28	22		34.6	27
Ouachita:					
Arkadelphia, Ark.	12	{ 11	13	19.2	12
		18	20	19.6	19
Camden, Ark.	30	13	27	40.7	21

1 Continued at end of month.

2 Continued from last month.

[All dates in May unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
WEST GULF DRAINAGE					
Sabine: Logansport, La	<i>Feet</i> 25	24	(1)	<i>Feet</i> 34.1	28-29
Trinity:					
Dallas, Tex	25	12	26	36.3	14
Trinidad, Tex	28	8	(1)	42.7	21
Long Lake, Tex	40	13	(1)	46.7	23
Riverside, Tex	40	25	(1)	45.8	29
Liberty, Tex	25	18	(1)	27.9	June 3
Trinity, Elm Fork: Carrollton, Tex	7	14	14	7.1	14
Brazos:					
Waco, Tex	27	18	19	29.3	18
Washington, Tex	45	21	22	45.9	21
Rio Grande:					
San Marcial, N. Mex	3	{	(2)	3	3.8
	6		6	3.1	6
San Benito, Tex	23	31	(2)	23.5	June 2
PACIFIC DRAINAGE					
Colorado: Parker, Ariz	7	(2)	(1)	9.1	1, 2, 4, 5, 9, 10, 11.
Colorado, Roaring Fork:					
Carbondale, Colo	5	31	31	5.1	31
Gunnison: Delta, Colo	9	29	31	9.3	31

1 Continued at end of month.

2 Continued from last month.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, MAY, 1930

By J. B. KINCER

General summary.—During the first decade showers and some beneficial rains occurred in the Southwest and parts of the South and Southeast, but in most Eastern States little or no relief from the drought was afforded. In these droughty areas spring planting was retarded and germination and growth were slow, but in the heretofore dry Southwest many areas were too wet, with farm work retarded and some injury from washing soil. Outside of these areas the weather was largely favorable with the crop season 10 days to two weeks ahead of the average, although it was somewhat too cool for best growth in the West.

During the second decade unseasonably low temperatures in the interior valleys retarded growth of warm-weather crops, with more or less local frost injury reported over a considerable area in the central-northern portion of the country. Frequent rains and wet soil delayed farm work in most trans-Mississippi sections, while there was some damage by washing soil and flooding lowlands in the lower Mississippi Valley and sections to the westward; otherwise farm work made generally good progress.

During the last decade temperatures continued too low for good growth and this coolness, together with deficient rainfall, retarded progress of practically all crops, and especially those of the warm-weather variety. Heavy to killing frosts were reported from the northern tier of States from the Lake region westward, but damage was confined chiefly to gardens and truck. Less rainfall in the south-central portion of the country, especially in the lower Mississippi Valley, was favorable, but rain was generally needed in most parts from the Ohio Valley eastward and locally elsewhere.

Small grains.—During the first decade continued dry weather in most parts of the eastern Winter Wheat Belt resulted in rather poor advance of the crop, although there was some temporary relief by showers locally. In Kansas rainfall varied widely, but wheat showed improvement, with heading noted in south-central and southeastern parts. Rains improved conditions in the more south-